FINDING OF NO SIGNIFICANT IMPACT
FOR THE PROPOSED
LNG from Coal Mine Methane for Industrial and Transportation Applications

AGENCY: U.S. Department of Energy (DOE)

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: DOE has prepared an Environmental Assessment (EA), DOE/EA-1546, to analyze the potential environmental consequences that would result from participating, through a cooperative agreement between the DOE and Appalachian-Pacific Coal Mine Methane Power Co., LLC of Arlington, VA, in a project to construct and operate a facility to make liquefied natural gas (LNG) from coal mine gas (CMG) for industrial and transportation applications. The facility will be located in western Monongalia County, West Virginia. The facility, if successful, could demonstrate a process that has the potential to reduce methane emissions from coal mines providing an economically viable means to reduce emissions of methane, a significant greenhouse gas. DOE will provide $4,606,844 (less than 50%) of the total project cost to design, construct, and initially operate the LNG facility.

Based on the analysis in the EA, DOE has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969, 42 United States Code 4321 *et seq*. Therefore, preparation of an Environmental Impact Statement is not required, and DOE is issuing this FONSI.

COPIES OF THE EA ARE AVAILABLE FROM:

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BACKGROUND: As part of its stated agency mission, the U.S. DOE's National Energy Technology Laboratory (NETL) provides science, technology, and policy options to resolve environmental, supply, and reliability issues associated with the use of fossil energy. Consistent with this mission and in partnership with its stakeholders, NETL supports efforts by industry to increase energy efficiency, minimize waste, reduce environmental impacts, and increase the

availability of domestic energy production through productivity and operational enhancements and improvements. The Gas Technology Management Division of the NETL Office of Natural Gas implements external research, development, and demonstration (RD&D) projects for natural gas processing, transportation fuels and chemicals, fuels advanced research, energy conservation, and military applications.

Coal mine methane (methane that is released from coal seams as a consequence of the mining process) is one source of natural gas that NETL is investigating as a potential resource for energy production. Methane is removed from coal seams either in advance of mining operations using conventional drilling techniques or by mine ventilation systems during active mining operations. Methane is vented from coal mines out of safety concerns for miners working the mine. Additionally, once a seam is mined out using longwall mining systems, the overlying rock layers collapse filling the void left from mining. This collapsed area, referred to as "gob", can contain methane in recoverable quantities, which is sometimes referred to as "gob gas", a mixture of air, methane, and other gases.

The majority of coal mine methane is simply released to the atmosphere thus contributing to the "greenhouse effect," which describes the buildup of heat on the earth's surface due, in part, to thermal radiation from the atmosphere. Energy from the sun enters and passes through the atmosphere, heats the earth's surface, and is radiated back into the atmosphere. Atmospheric gases absorb some of this outgoing energy. The atmosphere, in turn, radiates energy in all directions - including back toward the earth's surface. Because the earth's surface is heated to a greater degree than would occur in the absence of atmospheric radiation, the result is a "greenhouse effect," similar to the effect resulting from use of glass panels in a garden greenhouse to retain heat from the sun.

To examine technology opportunities for using coal mine gas and reducing greenhouse effects, NETL released solicitation number DE-PS26-00NT40767, entitled Recovery and Utilization of Coal Mine Methane: Pilot-Scale Demonstration Phase, on March 10, 2000. The objective of the solicitation was to demonstrate state-of-the-art approaches for methane gas recovery and beneficial use. The resulting demonstrations would provide coal and energy companies with cost-effective, commercial technology systems to reduce methane releases from underground coal mining operations, thus reducing methane contributions to the greenhouse effect.

DESCRIPTION OF THE PROPOSED ACTION: The proposed action is for the United States Department of Energy to provide, through a cooperative agreement resulting from a proposal submitted under the referenced solicitation by Appalachian-Pacific Coal Mine Methane Power Co., LLC (Appalachian-Pacific), cost-shared financial support to demonstrate a process to make LNG from coal mine gas for use as a fuel for industrial and transportation applications. The proposed facility would be located on property presently owned by Eastern Associated Coal Corporation and leased by Northwest Fuel Development, Inc. (Northwest Fuel). The property is located on what is locally referred to as the Parrish Shaft site near the unincorporated town of Crossroads in rural western Monongalia County, WV.

Under the proposed action, DOE would provide $4,606,844 (less than 50%, of the total project cost) through a cooperative agreement with Appalachian-Pacific to design ,construct, and initially operate a facility to demonstrate a process to collect coal mine waste methane emissions and convert the methane to LNG for consumption by commercial LNG users in industrial and transportation applications.

The proposed facility would capture approximately 1.29 to 1.80 million standard cubic feet per day of coal mine gas and convert it through a gas clean up and refrigeration process into 9,200 to 10,000 gallons per day of LNG. Up to 30,000 gallons of LNG would be stored on-site prior to removal by tanker trucks to various customer locations. Overall, the system would use approximately 750,000 cubic feet per day, at ambient conditions, of coal mine methane that would otherwise be used by Northwest Fuel to generate electricity or vented to the atmosphere.

ENVIRONMENTAL CONSEQUENCES: The environmental consequences of the proposed project included the potential effects on the following environmental resources: air quality, water quality, socioeconomic resources, safety and health, floodplains and wetlands, flora and fauna, cultural and historic resources, soils and geology, noise, environmental justice, and aesthetics. The environmental analysis identified that the most notable changes to result from the proposed action would occur in the area of noise. No substantive adverse impacts or environmental concerns were identified from analyzing the effects of these changes.

Air Quality: The proposed project would refine coal mine waste methane, removing impurities (such as water, oxygen, carbon dioxide, and nitrogen) from the methane stream and venting them through a stack. The proposed project would emit small quantities of NO_x (<0.009 tons/year), PM_{10} (<0.0007 tons/year), and SO_x (<0.000001 tons/year). Appalachian-Pacific filed with the West Virginia Department of Environmental Protection – Division of Air Quality (WVDEP-DAQ) for a determination of permit requirements. WVDEP-DAQ determined that the proposed project would not require a state air permit as defined under 45CSR13.

Water Quality: A modest amount of water would be produced or used during normal operation of the project. Normal maintenance activities would be performed on project equipment. These activities would include the periodic change out of lubricants - including oil and grease. Unexpected equipment breakdown could also occur. Depending on the nature of the equipment failure, oil, grease or mixed gas refrigerants could escape from fluid reservoirs. Regular inspection of the equipment would be performed to identity potential failures. Routine maintenance would be performed and spill control measures (sorbent spill pads and socks) would be used to contain and cleanup any incidental nuisance spills. There are no wastewater facilities available at this small rural project site. Area homeowners use septic systems for disposal of domestic wastewater. Portable restroom facilities would be rented by Appalachian-Pacific. No permanent restroom facilities would be constructed at the project site.

Socioeconomic Resources: The proposed project would not require a permanent on-site workforce, and the number of workers employed during the construction phase of the project would be small in comparison with the total non-farm employment base in Monongalia County. Thus, the proposed project would not increase school-aged population or have any adverse

impacts to local educational or recreational resources. Some minor increase to the tax base due to construction and operation of the new LNG facility may occur.

Safety and Health: Safety and Health pertains both to the workforce that would be employed in the installation and operation of the proposed project and to the public at large. The workforce would include any transient workforce involved in installation as well as the permanent workforce employed in the operation of the LNG facility and those employed to transport the LNG offsite. Personnel servicing the installation and operation phases of the proposed project - such as those making deliveries to the site, are also considered within the resource of Safety and Health. Workers employed at the site would be subject to applicable OSHA safety standards, which are identified in the EA. The proposed project will create approximately 10,000 gallons of LNG per day and will have the capability of storing up to 30,000 gallons of LNG. LNG weighs approximately 3.7 lbs/gallon, so 30,000 gallons of LNG represents 111,000 pounds of methane. Methane is a flammable gas. Quantities of methane on-site in excess of 10,000 pounds would trigger OSHA's process safety management (PSM) regulations, and Appalachian-Pacific will prepare a Risk Management Plan (RMP) as required by OSHA and EPA. DOE will review the RMP prior to production of LNG. The requirement for this review will be incorporated into a Mitigation Action Plan.

When natural gas is cooled to approximately -260^{o}F, it condenses into a liquid, LNG. During the liquefaction process, oxygen, carbon dioxide, sulfur compounds, and water are removed from the natural gas. For waste coalmine methane, which is a mixture of coalmine methane and ventilation air introduced during mining operations, nitrogen must also be removed. The resulting liquid, LNG, is composed primarily (typically at least 90%) of methane, a flammable gas. The resulting liquid however, is nonflammable, and poses a significantly lower fire risk than other commonly used hydrocarbon fuels such as gasoline and propane. LNG is also colorless, odorless, non-corrosive, and non-toxic. LNG must be stored at extremely low temperatures. If allowed to come into contact with ambient temperatures, the super-cooled liquid will heat up and will volatilize back to its gaseous state. The volatilization can be gradual or sudden, as would be expected should LNG be released and come into contact with land or surface waters.

LNG would be stored on-site and transported once or twice per day over public roads and highways. On-site facilities would be constructed in compliance with National Fire Protection Association standard 59A, which covers the design, construction, and operation of LNG facilities and includes requirements for secondary containment structures. Transport vehicles would be properly placarded. The potential for methane from an accidental release of LNG to the containment area to result in a vapor cloud explosion is low. The vapor would be unconfined, and LNG vapor (methane) is not explosive in an unconfined environment. As LNG vapor warms above -160^{o} F it becomes lighter than air and will rise and disperse rather than collect near the ground. Additionally, natural gas vapors do not burn rapidly like gasoline. Rather, natural gas vapors form a slow burning flame that burns back to the source of the natural gas vapor.

DOE analyzed the consequences of an accidental release of LNG under a worst-case scenario with a resulting vapor cloud ignition. The results of the consequence analysis predict that the potential impact of such a worst-case release would not extend to the nearest residents.

Floodplains and Wetlands: The proposed main project site would consist of a graded area, approximately 70 by 80 feet. It would be located slightly up slope, approximately 200 feet north of Right Branch of Miracle Run. The area has been previously disturbed by the prior surface support activities associated with deep mining in the area, construction of an electrical substation, current power generation activities, and associated access roads and parking areas. No documented wetlands exist in the immediate area of the proposed site, based on U.S. Fish and Wildlife Service National Wetland Inventory maps (1987) and confirmed during a site visit.

Appalachian-Pacific contacted the Monongalia County Flood Plain Administrator and commissioned an engineering study of the proposed site to determine if any parts of the proposed project would intersect with the floodplain of the Right Branch of Miracle Run. The engineering study concluded that no project equipment would be located in a floodplain, and the County Floodplain Administrator confirmed that no impacts to floodplains would be expected from and that no floodplain permit would be needed for the proposed project.

Flora and Fauna: The proposed project would be located on a previously disturbed site, where adverse impacts to fish, plant, or wildlife species from construction or operation activities would be minimal. Some native fauna may avoid the immediate project area due to increased levels of human activity and associated noise, but this effect would be localized and would diminish with time, as animals acclimate to the project. No Federally listed threatened or endangered (T&E) species are known to occur in the area. Consultation with the U.S. Fish and Wildlife Service confirmed that the project area does not support any T&E species or critical habitat.

Cultural and Historic Resources: The proposed project would be located on previously disturbed property. As part of the scoping process and to comply with Section 106 of the National Historic Preservation Act, DOE consulted with the West Virginia Historic Preservation Office, which confirmed that no properties of historic or cultural significance are known or expected to exist within the project area.

Soils and Geology: Soils at the proposed site have been previously disturbed, and the proposed project would not alter the current use. Standard construction practices, including control of runoff and re-seeding of disturbed areas, would be used. No long-term impacts to soils or the local geology would be expected as a result of the proposed action.

Noise: Residents nearest to the proposed site have reported noise from the Parrish Shaft site going back many years when a mine exhaust fan was located on the property. More recently, electricity generating activities of the current lease-holder (Northwest Fuel), have, at times, contributed to a perception by nearby residents of intrusive noise. The property line of the proposed site is located approximately 100 feet (30 meters) from the nearest residence, a single family dwelling immediately northeast of the site. The actual LNG production facility would be located near the center of the proposed site at a distance of approximately 1,000 ft (330 meters) from the nearest residence.

The equipment to be used in the proposed project which could contribute to environmental noise, are two compressors. These units are acoustically insulated and have an expected noise output of less than 80 dBA. Smaller units are not expected to produce any noticeable noise. Given the small noise signature, the distance from the property line, and the shielding of the proposed project by the intervening hillside, no additional noise attributable to the LNG production operations is expected to be discernible at the property line. Transportation of the LNG from the site would produce some additional noise. No more than two trucks per day are anticipated being needed, and these trips would be scheduled during daylight hours when any additional noise contribution would be indiscernible from normal vehicular traffic in the area.

To address the concern of nearby residents over historic noise at the site, Appalachian-Pacific has agreed to contract language with the current lease-holder (Northwest Fuel) to limit noise at the property line to the level previously analyzed as having no significant impacts on community noise. DOE has incorporated this language into its cooperative agreement with Appalachian-Pacific. Monitoring requirements will be included in a Mitigation Action Plan.

Environmental Justice: The population potentially affected by the proposed project would not be classified as an environmental justice community. In addition, the proposed Federal action would not be expected to result in either an adverse impact on the environment or a disparate application of environmental laws or policies.

Aesthetics: The proposed project would occur on a site previously disturbed by mining and power generation activities. The topography of the area varies from a flat stream valley to steep hills and small ridge lines. Elevations of nearby hilltops exceed 1600 feet above sea-level, and the topographic relief (the difference between the lowest and highest elevations) in the vicinity of the proposed project is over 400 feet. Vegetative cover on the valley and slopes includes hardwoods and evergreens reaching heights of 70 ft.

The horizontal stationary storage tank for the LNG would not be noticeable from the road when approaching the site from the east. When approaching from the west, the view of the site would generally be obstructed by topography and trees. Further, the proposed project consists of low, modular units and similar in visual impact to previous activities on the site. Security lighting for the site would be located as close to ground level as practicable and limited in number and output to that necessary for site security and to protect workers. Lighting would be directed away from near-by residences to the extent practicable.

ALTERNATIVES CONSIDERED: In addition to the proposed action, DOE considered the No Action Alternative, whereby DOE would not provide cost-shared funding to the project. Without DOE participation, Appalachian-Pacific potentially could continue the project with private funding, in which case the environmental consequences would be similar to those expected from the proposed action with the exception of noise. Without the restrictive language under the proposed action limiting noise impacts, noise could be greater under the No Action Alternative. More likely, the No Action Alternative would result in termination of plans for the project. If the project does not proceed, it is likely that Northwest Fuel would continue to use the

coal mine gas to which it has rights to produce electricity. Noise impacts would be expected to be similar to those experienced currently.

DOE analyzed the alternative of using a vertical storage tank instead of a horizontal tank. A vertical tank would require deeper footers potentially disturbing more ground and would introduce greater visible impacts to the community. A higher vertical tank would also produce greater consequences under a worst-case release scenario.

PUBLIC AVAILABILITY: The draft EA was distributed for review and comment to Federal and state agencies and to the public and posted on the NETL website. A legal notice advising of the availability of the draft EA for public review and comment was placed in the *Dominion Post* for three days, and copies of the draft EA were made available for review in the Public Library in Morgantown, WV and in the Clay-Battelle Public Library in Blacksville, WV. DOE received two comments regarding the proposed action. One comment expressed frustration over the responsiveness of the current lease-holder at the site to noise concerns and expressed the hope that noise at the site would not increase. As noted in the EA prepared for the proposed project, which is incorporated by reference into this determination, Appalachian-Pacific has agreed to contract language with the current lease-holder (Northwest Fuel Development, Inc.) to limit noise at the property line to the level previously analyzed as having no significant impacts on community noise. The proposed project would not be expected to create adverse noise levels for nearby residents. One additional comment noted that the times identified for school bus schedules contained in Table 4.4 did not reflect the actual pick-up and drop-off times at the bus stop nearest to the site. DOE revised Table 4.4 to include the times at which school buses would stop nearest to the site of the proposed project.

DETERMINATION: Based on the information and analyses in the EA, DOE has determined that the proposed Federal action, to provide cost-shared financial support to design, construct, and initially operate a facility to make LNG from coal mine gas for industrial and transportation applications, does not constitute a major Federal action that would significantly affect the quality of the human environment, within the meaning of the National Environmental Policy Act. Therefore, an Environmental Impact Statement is not required, and DOE is issuing this FONSI.

Issued in Pittsburgh, PA this 3rd day of March, 2006.

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